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RefugeUpdate

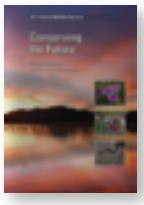
National Wildlife Refuge System

www.fws.gov/refuges

INSIDE: The 20-mile stretch of beach at Florida's Archie Carr National Wildlife Refuge is considered one of the most important sea turtle nesting beaches in the world. Here, a loggerhead sea turtle hatchling heads toward the ocean. At 251.9 acres, Archie Carr Refuge is featured in the Focus section, which begins on page 8 and is titled "Special Little Places." (Vince Lamb/Friends of the Carr Refuge)

Fostering a New Generation Of Outdoor Enthusiasts

The newest *Conserving the Future* implementation team – the Outdoor Recreation Team – is developing a strategy to expand outdoor recreation on national wildlife refuges to fulfill Recommendation 18 (*http://1.usa.gov/1yftGMA*). The goal is to create a Refuge System recreation program that is relevant and accessible to all Americans in order to create a connected conservation constituency.



The team is chaired by Marcia Pradines, chief of the Division of Visitor Services and Communications; Will Meeks, assistant regional director for refuges in the Mountain-Prairie Region; and Charlie Blair, assistant regional director for refuges in the Midwest Region.

"The Hunting, Fishing and Outdoor Recreation Team did a terrific job writing a strategic plan that will advance hunting and fishing on national wildlife refuges," said Pradines. "This new team is charged with looking at recreation such as wildlife observation and photography as well as activities that go beyond the traditional ones. The team will focus on recreation that is both compatible to the wildlife conservation mission of refuges but also more accessible to 'nature novices.' They

continued on pg 18

Focus: Special Little Places, pages 8-15

Can NEON Shed Light On Pelican Mystery?

By Ryan Moehring

North Dakota's Chase Lake National Wildlife Refuge is the nation's largest sanctuary for American white pelicans. It hasn't always been so. Early last century, unregulated hunting of the birds for their plumes had pushed them to the brink. In 1908, President Theodore Roosevelt took action, designating Chase Lake as a bird refuge. Only 50 pelicans were counted there that year. Since then, pelicans have regularly returned – and flourished.

Still, when today's 30,000-strong flock arrived at Chase Lake Refuge last spring, the pelicans' primary nesting island had shrunk by about 40 percent since the previous spring.

For reasons yet unknown and despite normal precipitation, the lake's water level is rising. Since the 1990s, the

continued on pg 19

Chief's Corner

Never Think Small

Jim Kurth

As we feature some of our small places in this *Refuge Update*, I recall managing national wildlife refuges in Rhode Island and Connecticut years ago. I guess they were small in size, but I never thought of them that way.

I thought it was a big deal to fight to protect nesting piping plovers and roseate terns. I believed we were making progress in understanding how to restore coastal habitats. I knew that there was a lot of support for wildlife conservation in those states, and that we weren't very effective in organizing it. Decades later, I marvel at the progress.

The Friends of Rhode Island Refuges is a fantastic support group and advocate for conservation. The Kettle Pond Visitor Center at Ninigret National Wildlife Refuge is an asset for the U.S. Fish and Wildlife Service and the community. Our science and management are far advanced from what we knew back then. I am proud of what our staff there has done. It is not small; it is an amazing set of accomplishments.

That story repeats itself across the Refuge System. We could describe President Theodore Roosevelt's action of setting aside 5.5-acre Pelican Island in Florida as protecting a small place. I'm sure even he didn't realize what the Refuge System would grow to become. Most of us never get the chance to take an action of historic proportion like Roosevelt did. That's just not how the world works.

We do our jobs and make progress inch by inch, building on the "small" steps taken by those who came before us. Once in a while, an opportunity like the Alaska National Interest Lands Conservation Act or the Presidential Proclamations that created new marine national monuments allows for really big steps.

continued on pg 18

At 868 acres, Ninigret National Wildlife Refuge may not be large, but its wetlands, trails and Kettle Pond Visitor Center (above) are important assets for the U.S. Fish and Wildlife Service and the community near Charlestown, RI. (USFWS)

Refuge Update

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Inside

Correction

The last name of late wildlife biologist and sculptor Alfred Godin was misspelled in the November/December issue. His cast-bronze sculptures of endangered whales are on display at the Maine Coastal Islands National Wildlife Refuge Complex visitor center through August.

Citizen Phenology at Valle de Oro Refuge

By Lindsay Brady

Valle de Oro National Wildlife Refuge, the first urban refuge in the Southwest, is taking part in a pilot project that uses volunteers to record phenology – cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life.

In cooperation with the Refuge System Inventory and Monitoring initiative, the New Mexico refuge is participating in Nature's Notebook, an online monitoring program of the USA National Phenology Network (NPN).

NPN describes Nature's Notebook as a national effort in which "professional scientists and amateur naturalists regularly record observations of plants and animals to generate long-term data sets used for scientific discovery and decision-making."

Valle de Oro Refuge manager Jennifer Owen-White hopes that by partnering with NPN and engaging nearby communities, she will be able to collect the data needed to gain an understanding of the ecological condition of the refuge, which was established in 2012.

Before 2012, the 570 acres just south of Albuquerque that are now the refuge were the longtime home of the Valley Gold Dairy. In the hopes of building on the community's strong connection to the land, a Facebook competition was held to name the new refuge. The winning name – Valle de Oro – is a nod to the dairy's history and reflects the heritage of the communities the refuge serves.

Valle de Oro Refuge is somewhat unusual in how its land was acquired. While most refuges acquire land through the use of federal funds, Valle de Oro received half of its land acquisition funding from non-federal entities.

For Nature's Notebook, NPN handles the recruitment and training of volunteers to observe, communicate and understand patterns in the phenology of plants, animals and landscapes, especially in response to climate change. NPN's educational staff works with schools and community organizations to provide training and to schedule volunteers. The volunteers, Friends groups and citizen scientists are the muscle behind the refuge's baseline data collection. The information they collect helps to inform sound management decisions on the refuge.

Snow geese and Ross's geese feed at Valle de Oro National Wildlife Refuge. The New Mexico refuge is participating in Nature's Notebook, a national program in which volunteers record observations of plants and animals to inform sound wildlife management decisions. (Copyright Sarah Neal/4 A Greater Good Photography)

"This landscape has seen a lot of use over the years. We rely on these data to tell us what kind of habitat we should restore and how," says Owen-White.

Albuquerque's Nex+Gen Academy High School has designed a senior project around data collection at the refuge. Students have selected four ecologically diverse sites at which to collect data and monitor wildlife, plants and habitat. Teachers are working with NPN to ensure that students collect accurate and rigorous data.

This large-scale collaboration is a good model that could be replicated at other refuges. "Partnerships are the key to success and sustainability at this refuge, at all refuges," says Owen-White, the only full-time staff member at Valle de Oro Refuge. Her advice to other refuges is to be open to outside help. "Other organizations have similar missions and want to be involved. So much more can be accomplished when you say 'yes' and explore ideas together."

One of the greatest outcomes of the partnership among Valle de Oro Refuge, NPN and the local community, Owen-White says, is that the people who use the refuge feel connected to it. "More and more people in our community know about this place, and we credit the involved community with our success," she says. "We want folks to know that we're here for them. Anybody is welcome to come spend 30 minutes, or half a day, at Valle de Oro."

Lindsay Brady is a social scientist at the Natural Resource Program Center in Fort Collins, CO. More about Valle de Oro National Wildlife Refuge's phenology work is at https://www.usanpn.org/fws/vdo

Shiawassee Refuge, Saginaw Paired in Livability Study

Part of Shiawassee National Wildlife Refuge is in the city of Saginaw, MI. The refuge is taking part in the two-year Federal Lands Livability Initiative. Here, visitor services manager Lionel Grant oversees a fishing day for local residents. (Remington Kissack)

By Karen Leggett

Shiawassee National Wildlife Refuge is participating in a two-year study that could help it become a more valued urban community asset.

Part of the central Michigan refuge is within the Saginaw city limits. Two hundred acres of its 10,000 acres border a low-income neighborhood hard hit by high unemployment and associated socioeconomic challenges.

"How could the refuge reach these underserved populations to go fishing or take a walk in a nice, serene setting rather than walk by vacant lots and boarded-up houses?" refuge manager Steve Kahl has asked himself.

Some answers might come from the Federal Lands Livability Initiative (*http://bit.ly/1rPtKPl*), a project of the Federal Highway Administration, the Department of the Interior and The Conservation Fund to assess and improve the livability of communities adjacent to protected lands. Besides Saginaw/Shiawassee Refuge, the project includes Sweet Home, OR/Willamette National Forest; Calhoun Falls, SC/Russell Dam and Lake; and Grand Lake, CO/Rocky Mountain National Park.

Friends of Shiawassee National Wildlife Refuge president Chuck Nelson, who teaches community sustainability at Michigan State University, sees an important distinction between Saginaw/Shiawassee and the other three locales: "All the other livability assessments are at places where part of the mission is to welcome the public. None has a [wildlife conservation] mission like the U.S. Fish and Wildlife Service … Most of the refuge is bordered by signs that say, 'Unauthorized entry prohibited.' "

Nelson, Kahl and Midwest Region refuge roads coordinator Brandon Jutz see potential for the project to focus fresh attention on livability and accessibility. For instance, nearby Saginaw Township has a new hiking-biking trail built mostly on an old railroad bed. "Another quarter-mile spur would take people to [the refuge's] Woodland Trail," says Kahl.

"The city is trying to deal with shutting down community parks they can't maintain, and we're trying to get kids outdoors," says Jutz. "How can we help them maintain a connection to the outdoors?"

The Livability Initiative's first step was a three-day assessment tour of the refuge and surroundings last September. It included people from all local cities and townships; the refuge and its Friends group; The Conservation Fund; and the Great Lakes Bay Regional Convention and Visitors Bureau. The Conservation Fund is scheduled to recommend action steps for a local team to consider this spring. The recommendation report is expected to highlight possible funding sources.

Visitors bureau CEO Annette Rummel says conversations so far have prompted community residents to begin seeing the refuge as an opportunity rather than a burden on the tax base. The refuge recently acquired a former golf course that includes a large pond. Kahl says children from the neighborhood already are asking to borrow refuge tackle to fish in the pond.

"One of my priorities is to make the refuge valued as a community asset," says Kahl, who sees the Livability Initiative as important to Saginaw on several levels. "If we are a site where people want to live, that's where employers want to establish themselves."

Michael Hanley, chairman of the Saginaw County Board of Commissioners, is looking for ways to "weave the refuge more tightly into our community … as a resource to improve the quality of life."

Hanley has high hopes.

"If we are building pathways into the refuge," he says, "we could build some pathways of imagination. Many of these kids have never seen a college campus, never been in the wild."

Jutz believes the Livability Initiative could be a blueprint for other refuges and a catalyst for changes "that go way beyond trails and transportation."

Karen Leggett is a writer-editor in the Refuge System Branch of Communications.

Forty acres that include Pine Brook Falls in Haddam, CT, are among many land parcels that Northeast Region realty specialist Tom Geser helped the U.S. Fish and Wildlife Service acquire for Silvio O. Conte National Fish and Wildlife Refuge. Geser received the 2014 Rudolph Dieffenbach Award. (Tom Geser/USFWS)

Realty Awards Go to Geser, Lowe and TNC Oregon

A fast-acting regional realty specialist in the Northeast and a project leader and non-governmental organization chapter in the Northwest are recipients of the 2014 National Realty Awards.

Dieffenbach Award

Northeast Region realty specialist Tom Geser received the Rudolph Dieffenbach Award. The award is given to a Division of Realty employee for significant contributions to the U.S. Fish and Wildlife Service's land acquisition systems, operation or mission.

Geser, a 16-year veteran of the Service, was cited for quick action in acquiring land at Silvio O. Conte National Fish and Wildlife Refuge and for his overall expertise and problem-solving skills.

"Navigating the maze of laws, regulations and policies that federal real estate acquisition requires can sometimes seem overwhelming. However, Tom does this all with precision and accuracy that in some cases is a first and resets the standard going forward," Northeast realty branch chief Bill Porter said in nominating Geser for the award.

In fiscal year 2012, when $6.5 million was appropriated unexpectedly for land acquisition at Silvio O. Conte Refuge, Geser closed on 23 parcels totaling $4.544 million and had obligated the majority of the remainder by the end of the year – despite the fact that those funds were not available until well into that year.

Land Legacy Award

Roy W. Lowe, recently retired project leader at Oregon Coast National Wildlife Refuge Complex, received the Land Legacy Award for his commitment to the lands and wildlife the Service protects. The award is given to Service employees or volunteers who do not work in the realty function.

Lowe, who was with the Service for more than 37 years before retiring at the end of 2014, was cited for "displaying a tireless advocacy for the lands and wildlife the Service protects."

Specifically, Lowe was honored for facilitating two important land acquisitions that comprise a spectacular peninsula at Nestucca Bay National Wildlife Refuge. The acquisitions of a 102.5-acre former Jesuit retreat property and the 90.1-acre Harder Tract both closed in 2013.

The aquired land, at the confluence of the Nestucca and Little Nestucca rivers, is now called the Two Rivers Peninsula Unit. The peninsula contains upland forest, shoreline and tideland habitats that benefit migratory songbirds, bald eagles, peregrine falcons, bobcat, black-tailed deer and various estuarine fish.

National Land Protection Award

The Nature Conservancy in Oregon received the National Land Protection Award for its role in the Nestucca Bay Refuge acquisition described above. The award is given to private citizens, groups, organizations, corporations, public agencies and their employees or volunteers outside the Service – for contributions to land protection for fish and wildlife resources in partnership with the Service.

"TNC Oregon demonstrated tremendous skill and partner support in these two critical acquisitions over an extended period of time," said Lowe. In particular, TNC obtained $2 million in Federal Highway Administration /Oregon Department of Transportation "Scenic Byway" funds, a rarely used source for conservation.

A New-Style Watering Hole at Sevilleta Refuge

By Karen Bailey-Bowman

When it comes to a wildlife drinking station, Sevilleta National Wildlife Refuge has gone naturalistic.

So many black bears were trying to access one small metal drinker at the central New Mexico refuge that staffers nicknamed it "the bear spa." The problem was the bruins were tearing apart the plumbing trying to soak in the cool water at the Pino Well site.

The drinker – one of 20 active on the 230,000-acre refuge – is an artifact of 40 years of ranching activities prior to the refuge's establishment in 1973. The drinkers range from huge metal tanks and concrete troughs to smaller Bureau of Land Management-style metal boxes with small openings.

The bears' frustration with the old-style drinker prompted refuge wildlife biologist Jon Erz to think outside the box – literally.

"The impetus for a more naturalistic drinker came about from problems with the bears' accessing the old-style drinker," Erz said.

The refuge built the approximately 12-foot-by-18-foot shallow rock and concrete naturalistic drinker at Pino Well with the help of a Youth Conservation Corps summer work crew and using supplies already on hand. "They dug a big depression, lined it with a big sheet of landscaping fabric and then put concrete and rocks in," refuge manager Kathy Granillo said.

A red-spotted toad and some oarsmen bugs showed up right away. Granillo expects the gently sloped edges and greater surface area will encourage more birds as well as reptiles and smaller mammals, such as bats.

"A big naturalistic drinker serves all wildlife," she said. "Bats need a four-foot diameter area to drink."

At top, a bear tries to access a small metal drinker at Sevilleta National Wildlife Refuge. As part of an effort to benefit bears and other wildlife, the central New Mexico refuge replaced that drinker with the naturalistic one below. (USFWS)

She said many refuges provide supplemental water for wildlife, but few use naturalistic drinkers. "Small drinkers are common in the West," she said. "They conserve water and serve game animals, such as ungulates and quail."

Sevilleta Refuge plans to build more naturalistic drinkers in coming years.

Karen Bailey-Bowman is a freelance writer and a member of Amigos de la Sevilleta, a refuge Friends group.

"The Power of Personal Connection"

By Bill O'Brian

A few years ago, Jose Gonzalez asked himself: Where are the Latino-led conservation organizations? Specifically, where is a hub to connect Latinos and nature?

"It was difficult for me to find," he says. When he learned that Internet domain names for "Latino" and "outdoors" were widely available, he thought: *Wow, something is missing here!* Not long afterward, a Latino student contemplating a conservation career asked him: Who should I talk to? Where should I apply? What organization could help me?

"I didn't have a really good answer," says the 33-year-old Gonzalez, a former public school teacher who was born in the Mexican state of Nayarit, migrated to the Unites States when he was 9, and grew up in California's Central Valley. So, in 2013, he founded Latino Outdoors. The online community — *http://latinooutdoors.org/* and *https://www.facebook.com/LatinoOutdoors* — launched in earnest last year.

Latino Outdoors is developing a Latino-led community with conservation and the environment as a primary focus. It is using its members to "tell stories and connect the different Latino communities throughout the U.S. to more outdoor spaces," says Gonzalez.

"We exist in two ways," he says. One way is via 10 leaders who support about 180 members and represent Latino Outdoors in eight locales: the San Francisco Bay area; Los Angeles; Sacramento; Modesto, CA; Humboldt County, CA; Texas; Wyoming; and Massachusetts. The second way is via social media, where Latino Outdoors has 1,800 followers and growing.

The goal is to create a community that removes the "isolation factor" among Latinos and Latinas in the conservation field, Gonzalez says. Latino Outdoors also seeks to show how traditional Latino values like family and respect can help connect everyday people to nature.

"In a lot of cases," he says, "it's not new. Communities are bringing their outdoor experiences from home countries."

Latino Outdoors stresses "the power of personal connection," Gonzalez says. "People are saying, 'I want to be able to meet with other people like myself who are doing this.' "

Latino Outdoors initiates family outings in partnership with existing community organizations and government agencies. It has orchestrated family outings to Muir Woods National Monument and Juan Bautista de Anza National Historic Trail; the National Park Service helped defray travel expenses. The nonprofit Stewards of the Coast and Redwoods provided camping equipment for an overnight outing. Latino Outdoors has led casual day hikes at Don Edwards San Francisco Bay and San Joaquin River national wildlife refuges.

Latino Outdoors encourages personal storytelling on its blog. One poignant entry is titled, "How I overcame my fear of 'El Cucuy' — or how I gained my independence without losing my family" (*http://bit.ly/1A7WILR*). El cucuy is Spanish for boogie man.

Latino Outdoors is starting a mentoring program for aspiring conservationists and outdoorspeople. The program will allow mentors "to showcase how they are using their culture and their background as an asset in this work," Gonzalez says.

Half of Latino Outdoors' members are bilingual; half are Spanish-speaking only. Its members are not exclusively Latino. "It isn't as though if you're not Latino, you're not welcome," Gonzalez says. "We've had participants of all backgrounds." Its leaders are mostly millennials and mostly volunteer. It receives administrative support from the California-based nonprofit Children Are Our Future, but "funding is a big need." Latino Outdoors seeks to give support to and receive support from conservation agencies. Mostly, it wants a place at the table, Gonzalez says:

"I get the privilege and opportunity to attend conferences or focus groups, and I look around the room and I ask myself, 'If I'm not here, who [from the Latino community] could be here in my place?' When it's hard for me to answer that question, I think about the need for me to push this forward."

Jose Gonzalez, a former teacher with a master's degree from the University of Michigan School of Natural Resources and Environment, founded the online community Latino Outdoors in 2013. He launched it in earnest last year. (Analisa Freitas/Latino Outdoors)

Small Is Good

Small places always have mattered to the National Wildlife Refuge System.

Pelican Island, the first national wildlife refuge, was just 5.5 acres when President Theodore Roosevelt established it in 1903. The refuge has since expanded to 5,400 acres on a nearby peninsula, but the island itself certainly fits the theme of this Focus section, "Special Little Places."

There are 33 national wildlife refuges with fewer than 100 acres; 126 smaller than 1,000 acres; 171 smaller than 2,000; and 252 with fewer than 5,000 acres.

Among refuges whose acquisition boundaries are 100 percent complete, here are the 10 smallest as of September 2014, according to the U.S. Fish and Wildlife Service Division of Realty:

1. ***Mille Lacs Refuge, Minnesota*** (.6 acre) – Its two islands are closed to the public and host bird nesting colonies.
2. ***Susquehanna Refuge, Maryland*** (3.79 acres) – Also known locally as Battery Island, it is in the mouth of the Susquehanna River.
3. ***Shell Keys Refuge, Louisiana*** (8 acres) – Composed mostly of shell fragments, the Gulf of Mexico islet refuge is a loafing area for white pelicans, brown pelicans, terns and gulls.
4. ***Pond Island Refuge, Maine*** (10 acres) – An island in the mouth of the Kennebec River, its treeless grass, forb and shrub cover provides excellent habitat for nesting seabirds.
5. ***Franklin Island Refuge, Maine*** (11.94 acres) – In Muscongus Bay, the island refuge supports nesting gulls, eiders, black-crowned night herons, Leach's storm-petrels and ospreys.
6. ***Green Cay Refuge, U.S. Virgin Islands*** (13.77 acres) – It was established in 1977 to protect the endangered St. Croix ground lizard and preserve bird nesting habitat.
7. ***Castle Rock Refuge, California*** (13.89 acres) – Offshore from Crescent City, the refuge is critical to several hundred thousand seabirds each year.
8. ***Three Arch Rocks Refuge, Oregon*** (15 acres) – One of the Oregon coast's best-known landmarks, the refuge provides habitat for more than 100,000 nesting seabirds.
9. ***Island Bay Refuge, Florida*** (20.24 acres) – Accessible only by boat, the refuge is a series of mangrove islands that provide breeding grounds for native birds near Cape Haze in Charlotte Harbor.
10. ***Thacher Island Refuge, Massachusetts*** (22 acres) – Offshore from Rockport, the refuge provides feeding, resting and nesting habitat for migratory birds.

Common tern chicks at Minnesota's Mille Lacs National Wildlife Refuge, which at .6 acre is the smallest refuge in the Refuge System. (USFWS)

Green Cay National Wildlife Refuge in the U.S. Virgin Islands is just 13.77 acres. It was established to protect the endangered St. Croix ground lizard and preserve bird nesting habitat. (Bill O'Brian/USFWS)

Maine's Pond Island National Wildlife Refuge is a 10-acre island in the mouth of the Kennebec River that provides habitat for nesting seabirds. (USFWS)

Three Arch Rocks National Wildlife Refuge is a "looming presence on the landscape that beckons you to approach." (Roy W. Lowe/USFWS)

15 Acres of "Wildness and Mystery" in Oregon

By Bill O'Brian

Three Arch Rocks National Wildlife Refuge is one of the most popular landmarks on the Oregon Coast – or any coast, really.

"The three large and six smaller rocks, totaling 15 acres, are massive and can be seen from miles and miles away," says Oregon Coast National Wildlife Refuge Complex visitor services manager Dawn Harris. "They are a looming presence on the landscape that beckons you to approach. They are near the shore but seem wild and distant from the hustle and bustle of the mainland."

Three Arch Rocks is also one of the nation's most distinctive refuges.

It is the oldest national wildlife refuge west of the Mississippi River. It was established in 1907 after conservationists William L. Finley and Herman Bohlman studied and photographed wildlife at Three Arch Rocks for years and persuaded President Theodore Roosevelt to conserve the rocks for the benefit of nesting seabirds and sea lions, whose populations were declining at the hands of hunters and sportsmen.

Three Arch Rocks Refuge, which once supported 250,000 seabirds, still has the distinction of providing habitat for more than 100,000 nesting seabirds, including tufted puffins, common murre, fork-tailed storm-petrel, Leach's storm-petrel, Brandt's cormorant, double-crested cormorant, pelagic cormorant, rhinoceros auklet, Cassin's auklet and pigeon Guillemot. The refuge is also the northernmost pupping site of the Steller sea lion in the Lower 48 states.

Visitors not only view the refuge, they hear it.

Despite being closed to public entry to prevent disturbance to wildlife, the refuge draws more than 300,000 visitors annually. Visitors view it from Cape Meares National Wildlife Refuge or Oceanside State Recreation Area. They not only view the refuge, they hear it.

"Summertime is magnificent at Three Arch Rocks. Warm sun-filled days with cool ocean breezes carry the raucous calls of tens of thousands of nesting seabirds from the distant rocks. You can feel the energy and excitement of the crowded colony of seabirds," says Harris, who calls the sounds emanating from the rocks "nothing but wildness and mystery."

Alicia Reed concurs. During storms especially, the long-time refuge volunteer enjoys watching waves crash through the big holes in the rocks and hearing the roar of the sea lions. "On a good day, it can be heard a long ways," she says.

Three Arch Rocks Refuge has other distinctions. It is the fourth-smallest of the 758 wilderness areas in the National Wilderness Preservation System. There is a book about it – *Sanctuary: The Story of Three Arch Rocks*, by children's author Mary Ann Fraser. To mark the refuge's 2007 centennial, Rogue Ales of Newport, OR, teamed up with the U.S. Fish and Wildlife Service to offer a limited bottling of Puffin Pale Ale. Some of the profits from sale of the brew were donated to the refuge environmental education program.

For Alicia Reed and her husband, Bob, the refuge has a personal distinction, too. "We got married in the tower at Cape Meares Lighthouse one year ago with Three Arch Rocks in the background, and that was definitely memorable," Alicia says. Both she and Bob are past

continued on pg 14

Sachuest Point Refuge: Ocean Beauty in the Ocean State

By Bill O'Brian

If you ask Rhode Island National Wildlife Refuge Complex volunteer coordinator Sarah Griffith why Sachuest Point National Wildlife Refuge is extraordinary, she'll tick off a list of reasons.

Rocky shore habitat at the 242-acre refuge five miles from Newport, RI, provides "excellent resting, feeding and nesting habitat for migratory birds, no matter what the season is," Griffith says.

Refuge saltmarsh restoration helps wildlife and people. A 2003-04 restoration on what was a town dump benefits shorebirds, herons, saltmarsh sparrows and even common terns, which nest offshore but teach their young how to fish in the marsh. An ongoing Maidford River saltmarsh restoration addresses flooding while improving the ecosystem.

Panoramic ocean views are a treat for the refuge's 200,000 visitors annually, particularly from Price Neck Overlook Trail, a spur off the main trail that is publicly accessible year-around.

"On a nice summer day you can stand up there and look out and see ducks down in the ocean and see across the way to the Sakonnet Point Lighthouse. You can also see to the refuge's Island Rocks, where there are usually a lot of birds," says Griffith. "I often joke with our volunteers that I'm going to set up a tent out on the trail and make that my office."

Then there is the Price Neck formation itself.

It is 600 million-year-old rock that was part of Africa before the global supercontinent Pangaea split along tectonic plates.

… and the golden rod.

Sachuest Point National Wildlife Refuge in Rhode Island is known for its ocean views, particularly from Price Neck Overlook Trail, which features 600 million-year-old rock that was part of Africa. (Sarah Griffith/USFWS)

"I absolutely love Sachuest Point in the late summer/early fall. That's when you have all the golden rod blooming," says Griffith. "The field habitat that we have here will just look like a golden blanket of blooming golden rod. Then you'll also see the small cherry tomato-like fruits of the beach rose that are starting to come out. And then take that combined with the hawks starting to come into the refuge, like the northern harriers, and watching them gliding almost effortlessly along with the warm ocean breeze. For me, there's nothing like it."

… and the Harlequin ducks.

"This is the southernmost area that they'll currently migrate to during the winter," says Griffith. "The males are just so comical-looking in their coloration. Of course, their coloration is what they got their name harlequin from. But being such a small duck, it's so fun to watch them because they'll dive into the roughest surf … They always just look like they're having so much fun."

… and "the rich human element."

The refuge was established in 1985. Before that, the land was home to ancestors of the Wampanoag and Narragansett tribes 10,000 years ago; a farm and sheep pasture from the 1600s through 1939; and a Navy installation during World Wars I and II.

Andy Levesque agrees that Sachuest Refuge is special. He and his wife, Jean, are two of 35 active volunteers who together contributed 3,200 hours of work in 2013. He calls his 17 years of volunteering at the refuge "a love affair." He's 84 ("but I'm a spring chicken"). Jean volunteers in the visitor center and the Friends' nature-gift shop at Sachuest Point. Andy drives a tractor-mower to clear trails and help control invasive species.

He's also a guardian of the refuge.

Visitors come from all over the world to see Sachuest Point Refuge, says Levesque, "and they don't want to leave. There was one fellow, I think he was from Russia, who wanted to know if he could buy the place and build a mansion."

Levesque politely told him no.

Synergy Along the South Shore of Lake Superior

By Bill O'Brian

While Whittlesey Creek National Wildlife Refuge is smaller than 340 acres and attracts just 5,000 visitors annually, it has outsize influence in terms of conservation, outreach and heritage.

"It may be a little refuge, but it's part of something very large and significant," says Jason Maloney, a U.S. Forest Service employee who is director of the multiagency Northern Great Lakes Visitor Center, which serves as headquarters for the refuge and other public lands along Lake Superior in Wisconsin.

"The center's venue and partnerships are invaluable," says wildlife biologist Mike Mlynarek, who has been at the refuge for all 11 years of his U.S. Fish and Wildlife Service career.

The synergy among the federal, state, local, nonprofit and other agencies represented at the Northern Great Lakes Visitor Center helps give the refuge its outsize influence. Those entities include the Forest Service, National Park Service, Wisconsin State Historical Society, Friends of the Center Alliance Ltd. (FOCAL) and University of Wisconsin Extension.

The center, which draws 125,000 visitors a year, informs the public about Whittlesey Creek Refuge and its mission. Just as important, says Maloney, the center fosters "cross-pollination and sharing of resources" among its partners.

"It changes everything I do because I have a Fish and Wildlife Service biologist sitting 30 feet from me," says Maloney, noting that agencies share seasonal workers and cooperate on initiatives like the Lake Superior Landscape Restoration Partnership and events like the annual Chequamegon Bay Birding & Nature Festival.

In terms of wildlife conservation, the refuge is particularly important to coaster brook trout, a fish that spawns in 15-mile-long Whittlesey Creek and spends its adult life in Lake Superior. As climate changes, the refuge is predicted to be rare Wisconsin habitat that will support brook trout.

Whittlesey Creek flows through its namesake refuge into Lake Superior in northern Wisconsin. (USFWS)

"Brook trout are an indicator species of environmental health since they only thrive in cold, clean water. If they are threatened by climate change throughout much of their range, it's especially important to protect, enhance and restore spring-fed systems such as the Whittlesey watershed. Lake-run, or 'coaster,' brook trout already exist in the U.S. only as remnant populations," says Service biologist Mlynarek.

The refuge provides bird habitat, too.

"Migrating birds tend to follow Lake Superior's shoreline rather than make a long open-water crossing. This results in large migrations of species that often rest and feed along the sheltered bay area before continuing on the flyway," says Mlynarek. "I've seen two dozen eagles at the same time on a 150-feet-long sand bar at the mouth of Whittlesey Creek."

Regarding outreach, the refuge is an outdoor learning laboratory.

"I consider it a great privilege to mentor the next generation of conservationists," says Mlynarek, who each year brings dozens of Youth Conservation Corps students, Northland College students and their professors, Trout Unlimited members and other volunteers to the refuge for hands-on habitat-restoration experience.

On the heritage front, the refuge's "cool, rich, mossy northern white cedar forests, where springs seep and bubble out of the ground, are my favorite. It makes me reflect about what Native Americans

continued on page 14

Seal Beach Refuge: A Climate Change Lab

By Lisa Cox

For Seal Beach National Wildlife Refuge, the time to act is now.

The 965-acre refuge was established in 1972 to conserve habitats essential to threatened and endangered species, such as the California least tern and light-footed Ridgway's rail, as well as migratory birds. The refuge encompasses some of the last saltwater marsh in Southern California. The refuge is unusual because it's entirely within a naval station.

At Seal Beach Refuge, tidal channels meander through a sea of cordgrass delivering moisture and nourishment to support a healthy marsh ecosystem.

Climate change and sea-level rise make it increasingly challenging to maintain habitat for the endangered light-footed Ridgway's rail (formerly known as light-footed clapper rail) at Seal Beach National Wildlife Refuge south of Los Angeles. The refuge plans to implement a saltmarsh sediment augmentation restoration project to address the situation. (Kirk Gilligan/USFWS)

California least terns fly above the channels searching for small fish to carry back to nests. An array of marine organisms – from tube worms and sea stars to rays and sharks – thrive. The occasional green sea turtle even paddles by. The refuge serves as stopover and wintering habitat for thousands of migrating birds along the Pacific Flyway. It is an island of habitat amid dense urban development in Orange County south of Los Angeles.

However, climate change and sea-level rise make it increasingly challenging to maintain habitat for the light-footed Ridgway's rail (formerly known as light-footed clapper rail) and other marsh-dependent species. A recent U.S. Geological Survey study revealed that, because of land subsidence and lack of sediment inputs, Seal Beach Refuge marsh is experiencing an effective sea-level rise rate three times that of other Southern California marshes (6 mm/year vs. 2 mm/year). For other marshes, the 6 mm rate is not projected to occur until 2036. For Seal Beach Refuge, the situation is urgent.

So, the refuge plans to implement a saltmarsh sediment augmentation project and study the marshes' response. By placing 8-10 inches of clean dredged sediment over a 10-acre plot of low saltmarsh habitat, the U.S. Fish and Wildlife Service hopes that the refuge's plants and wildlife can adapt to sea-level rise and be a model for other wetlands' response to climate change.

"If we don't do anything to protect this marsh, the habitat will very soon convert to open water, and it will disappear," says Seal Beach Refuge manager Kirk Gilligan. "The marsh will not be able to migrate upslope because it's already surrounded by urban development directly around the edges of the marsh, and sometimes even within it."

Biologists estimate that 95 percent of Southern California saltmarshes have been lost to development and marinas. Tim Anderson, a long-time Seal Beach Refuge volunteer who has since left California, used to ask visitors: "If we were to force you to live on five percent of what you currently eat and five percent of the house you live in, how do you think you would survive? Well that is what we are asking our birds, crabs, sharks and rays to do."

Because it is on Naval Weapons Station Seal Beach, the refuge is open to the public only one Saturday per month – and visitors must pass a security check in advance and agree to be accompanied at all times by Service staff and volunteers. Thanks to a strong partnership among the Navy, Friends of Seal Beach National Wildlife Refuge and other organizations, the refuge accommodates about 2,000 visitors annually.

When they first get to the refuge, they aren't sure what they're in for.

"People are always surprised to see the extent of this wetland, because it's tough to visualize how large it is from outside the Navy fence line," says Gilligan. "They are always pleased to see such a beautiful expanse of cordgrass, birds and marine life."

Lisa Cox is a public information specialist at San Diego National Wildlife Refuge Complex, which includes Seal Beach National Wildlife Refuge. More about the saltmarsh sediment augmentation restoration project is at http://go.usa.gov/HXk3

Sea Turtles and More at Archie Carr Refuge

By Bill O'Brian

Wildlife refuge specialist Christine Trammell has a favorite time of day at Florida's Archie Carr National Wildlife Refuge: sunrise.

"It's just the calmness and the stillness of everything. You can hear the ocean, but not a lot of people are up or out there," she says. "The wind hasn't picked up yet, usually. It's very calming."

Trammell has a favorite habitat at the 251.9-acre refuge on a barrier island between the Atlantic Ocean and Indian River Lagoon on Florida's east coast: maritime hammock.

"A hammock has a dense canopy, so it's shaded, probably one of the few habitats on the refuge that provides that nice shade," she says. "I like it because it's one of the quieter areas on the refuge."

She has a favorite species at Archie Carr Refuge, too: the leatherback sea turtle – "just because of its sheer enormity. It's like you come across a VW Bug on the beach."

"We easily can have a nest every couple feet."

Sea turtles are what make the refuge special, ecologically and for visitors.

"The Archie Carr 20-mile stretch of beach is the most important nesting beach for loggerhead sea turtles in the world," says Trammell. "We easily can have a nest every couple feet between all the different species that nest there."

The turtles thrive because the refuge is on an island with turtle-conscious ordinances, few businesses and land conserved by the state of Florida and two counties.

Last year, the refuge hosted 15,103 loggerhead sea turtle nests, 1,812 green sea turtle nests, a record 79 leatherback sea turtle nests and at least one Kemp's Ridley sea turtle nest.

Sunrise at Florida's Archie Carr National Wildlife Refuge. (Kevin J. Lowry/USFWS)

Archie Carr Refuge – established in 1991 and named after the late Archie Carr Jr., in honor of his contribution to sea turtle conservation – attracts 120,000 visitors annually from around the world. Most come through the Barrier Island Sanctuary Management and Education Center, which is owned by Brevard County. The Sea Turtle Conservancy, the Friends of the Carr Refuge and volunteers lead educational programs and help spread the refuge's conservation message out of that county facility.

Programs for visitors include morning Turtle Talks and nightime Turtle Walks.

The morning talks are generally led by refuge volunteers and include inspecting nests for overnight activity. "There is evidence of nesting turtles, especially green sea turtles. It looks like a mini-bulldozer was on the beach," says Trammell.

The nighttime walks during the height of the turtle nesting season, in June and July, are generally led by Friends and include watching sea turtles lay eggs.

continued on pg 14

Archie Carr Refuge is known as one of the most important sea turtle-nesting habitats in the world, but wildlife refuge specialist Christine Trammell appreciates its maritime hammock habitat, too. "I like it because it's one of the quieter areas on the refuge," she says. (Christine Trammell/USFWS)

15 Acres of "Wildness and Mystery" in Oregon — *continued from page 9*

presidents of Friends of Cape Meares Lighthouse & Wildlife Refuges Inc., the support group most closely affiliated with Three Arch Rocks Refuge.

Roy Lowe, who worked for 29 years at Oregon Coast Refuge Complex before retiring this year, points out another distinction associated with Three Arch Rocks Refuge: From one vantage point at Cape Meares State Park, you can see Three Arch Rocks, Oregon Islands and Cape Meares National Wildlife Refuges.

"I doubt you can see three refuges and two wilderness areas from one spot anyplace else," he says.

Sunset at Three Arch Rocks National Wildlife Refuge off the Oregon coast. Despite being closed to public entry, the refuge draws more than 300,000 visitors annually. (Bob Reed)

Synergy Along the South Shore of Lake Superior — *continued from page 11*

The cold, crystal-clear, spring-fed waters at Whittlesey Creek National Wildlife Refuge in northern Wisconsin are vital to coaster brook trout. (USFWS)

and early explorers experienced," says Mlynarek. "A large Native American settlement and a French trading post historically existed near the mouth due to the abundant game, fish, spring water and the junction of water and overland transportation routes."

Maloney also appreciates Whittlesey Creek Refuge's cultural importance.

"Chequamegon Bay and the Apostle Islands that are within sight of the mouth of Whittlesey Creek are the heart of the Ojibwe world," he says. "So it's very significant to have this refuge here – on this bay, on this lake – in the heart of the traditional Ojibwe world."

Sea Turtles and More at Archie Carr Refuge — *continued from page 13*

Each nest has roughly 100 eggs, but only one hatchling in 1,000 survives to adulthood.

"Interacting with a nesting sea turtle, standing three feet away while she is laying her eggs, is something people remember for a long time," says Vince Lamb, a Friend and volunteer since 2008. "The interactions we offer at Archie Carr Refuge are very special."

All of the refuge is on the barrier island, but all of the refuge is not sand and dunes. There is a lagoon side that "consists of mangrove swamps that line the Indian River Lagoon, which is the most biologically diverse estuary in all of North America," Trammell says.

Toward the lagoon side, the shady maritime hammock habitat Trammell so appreciates is important for woodrats and land crabs; mangrove swamps are important for nesting birds, for fish species whose young benefit from the organic material birds create in the water, and for crustaceans; and scrub habitat benefits the Florida gopher tortoise.

While turtles rightly are the prized wildlife resource and main visitor attraction, Trammell says, "visitors should know that Archie Carr Refuge is not just beach; there are those other habitats we were talking about, too."

Solitude in Suburban Denver

By Dawn Y. Wilson

Nestled among housing developments, medical office buildings and busy intersections in Arvada, CO, sits a testament to the collective conservation power of determined local residents: Two Ponds National Wildlife Refuge.

Established in 1992, it is one of the smallest urban wildlife refuges in the United States.

Its 72 acres, just 15 miles west of downtown Denver, provide habitat for more than 120 bird species and various mammals, reptiles and amphibians. They also provide a place of respite for city dwellers.

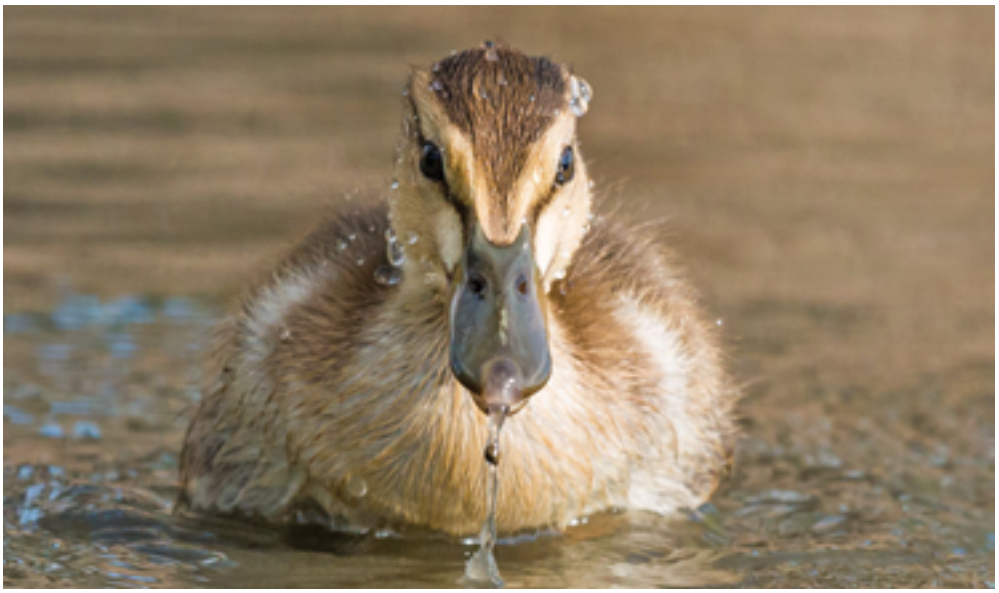
"I value the peaceful feeling I get while at Two Ponds," says Barb Lautenbach, a long-time refuge visitor. "It feels like an oasis in the city where I can go to get away from my worries for a while."

This urban gem of the National Wildlife Refuge System might never have happened had it not been for citizens dedicated to conserving open space.

Before the refuge's establishment, what is now Two Ponds Refuge was primarily agricultural land with a farm on which chickens and frogs were raised; a veterinary clinic; an apple orchard; horse pastures; and wetlands.

In 1990, 13 acres of that land were purchased for development. The buyer started the process to fill an acre of wetlands and rezone the land from agriculture to business/professional and residential. Local residents opposed the move and fought to emphasize the value of the land for wetland preservation and environmental education.

In September 1990, the Two Ponds Preservation Foundation was formed as a nonprofit corporation of local citizens. Since then, the foundation has worked with the U.S. Fish and Wildlife Service to preserve wetland habitat in Arvada.



*This mallard duckling is among the 120 bird species that can be seen at Two Ponds National Wildlife Refuge in Colorado. The 72-acre refuge 15 miles west of downtown Denver also provides habitat for various mammals, reptiles and amphibians. (Dawn Y. Wilson/*DawnWilsonPhotography.com*)*

Today, Two Ponds Refuge is 63 acres of uplands and nine acres of wetlands with three small ponds, all bordered by tall cottonwood trees. The uplands were historically mixed-grass and short-grass prairie. Over the years, the landscape changed as people farmed, livestock grazed and non-native plants were introduced. Remnants of the prairie can be seen in the tall vegetation that blankets the open meadows during summer.

"The mission of the Refuge System is to manage a national network of lands and waters for conservation, management and restoration of fish, wildlife and plant resources and their habitat," says Two Ponds Refuge manager Seth Beres. "Urban refuges, such as Two Ponds, must do this as well as engage urban communities in nature and wildlife conservation by providing diverse and relevant recreational and environmental education opportunities."

Two Ponds Refuge delivers on that mission with educational programs for local schoolchildren, community service projects for Scout groups, trails for visitors and wildlife-viewing opportunities for bird watchers and photographers.

"We enjoy Two Ponds because it is a place where we reconnect with each other and with nature," says Jack Van Ens, a volunteer who frequently visits the refuge with his wife, Sandy. "We love sitting at the gazebo near the cattail marsh where the birds are a choir to our ears."

Two Ponds Refuge is part of Rocky Mountain Arsenal National Wildlife Refuge Complex, which includes Rocky Mountain Arsenal and Rocky Flats Refuges.

"These three refuges are community assets – places to go and connect with nature," says visitor services manager Cindy Souders. "They give a sense of solitude, are easy to get to and are close to a large population."

Dawn Y. Wilson is a wildlife photographer and travel writer whose guidebook about the national wildlife refuges of Colorado is scheduled to be published early this year. Her website is www.DawnWilsonPhotography.com

Around the Refuge System

Minnesota

Tamarac National Wildlife Refuge and the White Earth Nation have entered into what may be the first official collaboration between a Native American tribe and U.S. Fish and Wildlife Service law enforcement. Service Midwest Regional Director Tom Melius met with White Earth Nation Tribal Chairwoman Erma Vizenor and other tribal dignitaries before formalizing the agreement with a signing ceremony last fall. The ceremony commemorated the completion of a memorandum of understanding between the White Earth Nation and the refuge as it pertains to conservation law enforcement activities on the refuge. "This agreement highlights our desire to work together with Native American tribes and collaborate for our mutual benefit," said Melius. "We recognize the importance of the unique relationship that Tamarac Refuge has with the White Earth Nation in the geographic sense, but more importantly in our common interest in preserving and sustaining natural and cultural resources for present and future generations."

Hawaii

Hawaiian Islands National Wildlife Refuge has been selected to receive the Refuge System Large Invasive Species Allocation of $1 million for fiscal year 2015. The refuge will use the funding to attempt to eradicate Indian fleabane (*Pluchea indica*) and restore wetland habitat at Laysan Island. Eradication would result in significant benefit to native species and have wide applicability for island managers throughout the Pacific who are battling other invasive species. Indian fleabane is a widely branching shrub that crowds out native vegetation. Its eradication from Laysan Island would preserve natural hydrology, restore native plant assemblage to wetlands and adjacent uplands, and promote recovery of a rare environment that is important for migratory seabirds and eight endangered species.

Louisiana

More than 1,700 acres of bottomland hardwood forest habitat were added to Red River National Wildlife Refuge last fall as part of a multi-year partnership between the U.S. Fish and Wildlife Service and The Conservation Fund. The transfer of 1,731 acres to the Service along the refuge's Lower Cane River Unit caps a five-year effort to restore nearly 4,500 acres at the refuge. "This project has been a great partnership, assisting the refuge in meeting its dual purpose to restore native habitats and provide habitat for migratory birds, particularly waterfowl," said refuge manager Pat Stinson. "These new areas also give us a chance to provide more hunting opportunities for our visitors in the fall and winter." Red River Refuge was established in 2000 with the goal of restoring the bottomlands associated with the Red River Valley to native hardwood forests.

Green-winged teal ducks paddle at Louisiana's Red River National Wildlife Refuge, where more than 1,700 acres of habitat were added last fall as part of a multi-year partnership between the U.S. Fish and Wildlife Service and The Conservation Fund. (Ronnie Maum/USFWS volunteer)

Sense of Wonder Recognition

Kathi Stopher, visitor services manager at Bear River Migratory Bird Refuge in Utah, is the winner of the 2014 Sense of Wonder recognition. Stopher was honored for her development of an outstanding environmental education program for visitors and the communities surrounding the refuge. That education program has reached more than 80,000 students, including all Box Elder and Cache County District fourth-graders who participate in the Bear River Watershed curriculum designed by Stopher. The environmental education program has energized the community's passion for the refuge and the importance of the Great Salt Lake ecosystem. The Sense of Wonder recognition annually honors a U.S. Fish and Wildlife Service employee "who has designed, implemented, or shown visionary leadership in an interpretive or environmental education program that fosters a sense of wonder and enhances public stewardship of our wildlife heritage."

California

Lynnea Shuck, a 17-year-old senior at Mission San Jose High School in Fremont, received the Brower Youth Award for a program she started at Don Edwards San Francisco Bay National Wildlife Refuge. Shuck was cited for founding the Junior Refuge Ranger Program, which teaches 8- to 11-year-olds how wildlife refuges protect endangered and threatened species and the importance of wetland habitats. Shuck has written a how-to guide to help refuge managers implement her program. "Eleven refuges in two states are working on starting it," she said. "Plans are under way to translate the Alviso Junior Refuge

Ranger Activity Booklet into Spanish." For more information, contact Shuck at *refugeranger@gmail.com*. The Brower Youth Award, named for longtime Sierra Club Executive Director David Brower, honors 13- to 22-year-old environmental leaders.

Missouri

A company that had planned to build a large wind farm near Squaw Creek National Wildlife Refuge decided last fall to scrap the idea and consider other locations because of possible adverse effects on important wildlife resources. Element Power of Portland, OR, had planned to build up to 133 wind turbines near the refuge and seven nearby conservation areas. The company had been studying the project for five years. It had leased 30,000 acres of nearby private land since 2010. Squaw Creek Refuge, 100 miles north of Kansas City, includes 7,415 acres of wetlands, grasslands and forests along the eastern edge of the Missouri River floodplain. The refuge attracts a variety of birds and waterfowl, including more than 1 million snow geese during spring or fall migrations. Hundreds of bald eagles migrate to the refuge by late fall and early winter. The northern long-eared bat, a proposed candidate for endangered species listing, also has been identified at the refuge.

Delaware

Bombay Hook National Wildlife Refuge is one of five sites featured on 2015 America the Beautiful Quarters, the United States Mint announced. On the reverse (tails) side of the coin, the Bombay Hook Refuge design includes a depiction of a great blue heron with a great egret in the background. The other four sites featured are the Homestead National Monument of America in Nebraska; Kisatchie National Forest in Louisiana; Blue Ridge Parkway in North Carolina; and Saratoga National Historical Park in New York.

Nevada

Sheldon National Wildlife Refuge is near a corner of the state that has seen an extraordinary amount of earthquake activity in recent months. Since July, more than 800 small quakes have been recorded where Nevada, Oregon and California meet. Two tremors in November measured at magnitude 4.7 on the Richter scale. Glenn Biasi of the University of Nevada Seismological Laboratory told the Associated Press that the seismic activity can be traced to the constant stretching of the Earth's crust. According to Biasi, the Sierra Nevada is moving northwest about a half-inch a year, leaving gaps in Nevada's northwestern corner, where one fault has produced hundreds of small quakes. Because the area is unpopulated, the quakes rarely have been felt by people.

New Mexico

David R. Dickinson, a frequent visitor to Bosque del Apache National Wildlife Refuge, produced a dramatic video photo essay of this great blue heron devouring a carp in the historic floodplain of the Rio Grande at the central New Mexico refuge. The video is available at this link: http://bit.ly/1xsFmvn

Maine

Six-acre Mahoney Island, approximately a mile off Naskeag Point on the state's central coast, has become part of Maine Coastal Islands National Wildlife Refuge. The Maine Coast Heritage Trust acquired the island from a private owner – using money from the Land and Water Conservation Fund and a North American Wetlands Conservation Act grant – before transferring the island to the U.S. Fish and Wildlife Service. Mahoney Island is the 11th parcel of land the trust has added to the wildlife refuge in the past decade. Maine Coastal Islands Refuge consists of 60 offshore islands and four coastal parcels, totaling more than 8,200 acres that span more than 250 miles of coastline.

Chief's Corner— *continued from page 2*

But mostly we keep pressing on, year after year, and small steps add up.

For the Refuge System, 112 years of small steps add up to 562 national wildlife refuges, 38 wetland management districts, two national monuments and four marine national monuments that protect 463,919,772 acres in all 50 states and all territories. Additionally, we co-administer 156,954,835 acres of marine monuments that are not part of the Refuge System, bringing the total Service responsibility to 620,874,607 acres.

I like to tell Refuge Management Academy students about a cassette tape that recorded the festivities at Marcus C. Nelson's 1979 retirement party. Mark was chief of the Refuge System when he retired. He talked with joy of his first job at Medicine Lake Refuge in 1937 during the Dust Bowl. Mark told his friends he had learned that the way to make progress, to get things accomplished, was to "never quit digging, never quit hacking away." He told them to never give up. Because if you stop and you were the only one trying, all progress stops.

When I first listened to his remarks, I didn't think of them as particularly eloquent. But as I thought about it, I realized what a perfect metaphor Mark had used. Those of you who have ever made a living in manual labor, who have used a shovel or machete as your tool, you understand what he meant. You keep digging and digging, and sooner or later you have a ditch that can move water or footers for a building. You have a boundary line that is marked or a trail that is blazed. You persevere and create something of lasting value. But you can never quit until it is done.

Think about it when you are having a rough day, trying to keep up with your workload despite having fewer staff and fewer dollars than you used to. Small steps make huge progress with perseverance. Never think small, never quit hacking away.

Mark and his contemporaries made progress during difficult times, because during those trying times they pressed on.

Fostering a New Generation of Outdoor Enthusiasts— *continued from page 1*

might be less comfortable in natural settings than people who have long been outdoor enthusiasts. This team is considering how to invite them to enjoy and care about wildlife, and help them become comfortable enjoying the great outdoors."

The Outdoor Recreation Team is assembling four sub-teams, working to prepare draft products as early as July. The sub-teams are:

- **Recreation Access:** The team will look at improving signs along highways and at other places that inform visitors and also research how transportation affects access. The team will consider how to streamline national guidance on accessibility, and calculate what it will cost in infrastructure investments to provide better access.
- **Appropriate Refuge Uses:** The team will develop additional appropriate uses guidance to focus on activities that attract new and diverse audiences and encourage partnerships with communities. New guidance would not compromise the standard that all recreation must be compatible with a refuge's conservation mission.
- **Wildlife Observation/Photography:** In an era when so many people have great cameras in their smartphones, the team is seeking to establish a photography initiative. The team will expand online resources – and develop training and mentoring opportunities for refuge staff and volunteers – in an effort to provide the Refuge System's photography offerings to a broader cross section of the public.
- **Other Recreation:** Going beyond the "Big Six" – hunting, fishing, wildlife photography, wildlife observation, interpretation and environmental education – the team will, among other tasks, assemble examples of the kind of expansive recreation offered on some wildlife refuges. It also will ensure that at least one outdoor skills center will be launched to help foster a new generation of outdoor enthusiasts.

The concept of outdoor skills centers came from the *Conserving the Future* Hunting, Fishing and Outdoor Recreation Team, which last year issued its strategy (*http://bit.ly/1vNt8dr*). It called on the U.S. Fish and Wildlife Service to undertake steps to increase quality hunting and fishing opportunities. The team also recommended greater collaboration with state agencies in hunting and fishing programs; development of guidance for continuation of fish stocking programs and consideration of new stocking programs; and mentoring of a new generation of outdoor enthusiasts, among other steps.

The new Outdoor Recreation Team expects to complete its work in about two years.

Can NEON Shed Light on Pelican Mystery?— *continued from page 1*

island has slowly shrunk, leaving less and less pelican breeding habitat. Not since records have been kept, however, has so much habitat disappeared so quickly.

Other anomalies have stumped biologists. In 2004, nearly 30,000 pelicans left the refuge, abandoning their chicks and eggs. The following year, there was a chick die-off. Again, adult pelicans abruptly departed. The exodus defied explanation. It was so massive that biologists hypothesized several factors must be at play.

None of this seems to have had permanent impact on the pelicans; they are raising chicks by the thousands. Still, the anomalies are troubling.

Coincidentally, Chase Lake Refuge hosts a National Ecological Observatory Network (NEON) core site. Refuge manager Neil Shook is looking to NEON to help solve the mystery.

Funded by the National Science Foundation, NEON is building 106 sites nationally to measure causes and effects of climate change, land use change, and invasive species on a continental scale. Once it is fully operational in 2017, NEON will provide free data, educational resources and scientific infrastructure for research.

NEON will also monitor atmospheric conditions (amount of carbon released and absorbed, temperature, humidity) and soil conditions (pH, humic matter, exchangeable acidity). Fiber optic equipment will live-stream data to NEON headquarters in Boulder, CO, where they will be analyzed and made publicly available.

"These data will be offered up in real time to any entity that wants to use them," says NEON manager Andrea Anteau.

NEON also will deploy seasonal field crews to observe biological systems. For instance, crews will conduct annual breeding bird surveys and trap mosquitos and ticks to study how climate change might affect the insects' role as disease vectors.

When American white pelicans arrived last spring at Chase Lake National Wildlife Refuge in North Dakota, their primary nesting island had shrunk by about 40 percent in one year. With help from the National Ecological Observatory Network (NEON), the refuge hopes to find out why. (USFWS)

This isn't the first time Chase Lake Refuge has housed a major scientific research center. Woodworth Station Waterfowl Production Area, site of the refuge's headquarters, was the primary U.S. Fish and Wildlife Service facility to study the life history, habitat needs and potential management of waterfowl and other migratory birds from 1963 to 1989. It was shuttered when the Service lost its biological research arm, but data remain valuable.

"So much of what we know about wetlands and waterfowl – all of that research – started here at Woodworth Station," Shook says. "NEON will allow us to leverage that valuable 50-year baseline and also enter into a new and exciting realm: climate change research."

Species are responding to climate change in unpredictable ways, Shook says. Some once-complementary species are no longer interacting, which disrupts complex interrelationships ecosystems need to thrive.

"We know that some birds are nesting earlier than ever before," he says. "Pelicans are arriving 16 days earlier than they did when we started documenting their arrivals 50 years ago. Some plants are flowering up to three weeks earlier than they did previously. These relationships are out of sync, and we need reliable data to measure the changes so we can make wise management decisions."

Meanwhile, Shook keeps an eye on the Chase Lake island mystery and other unexplained changes in prairie plant and animal communities.

Ryan Moehring is a public affairs specialist at the Mountain-Prairie Region office in Lakewood, CO.

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A Look Back … Chesley Dinkins

When Chesley Dinkins retired from the U.S. Fish and Wildlife Service in 1983, he was 73 – reported to be the oldest employee in the Service at the time – and he had spent his entire 43-year career managing Lake Ilo National Wildlife Refuge in North Dakota.

"All this job takes is common sense and the ability to work," said Dinkins, who had no interest in the flurry of media interest generated by his retirement. Then-regional director Galen Buterbaugh said that Dinkins' career spoke of stability and dedicated service at a time of constant change.

Dinkins began working as a Works Progress Administration foreman in 1936, managing construction of the dam that created Lake Ilo in the grasslands of western North Dakota. When the refuge was established in 1939, he became its only manager until his retirement.

Although he had only two years of high school, he observed and studied wildlife habitats, adapted plantings for ducks, grouse, pheasants and deer, and turned the 4,000 acre refuge into prime habitat. He used cover plantings, winter food plots, predator control and shelterbelts (windbreaks) to increase wildlife production. Twenty-eight acres of now-towering evergreens were planted as seedlings.

Dinkins and his wife, Polly, raised nine children – eight of them born in their home on the refuge – and all had refuge chores. Dinkins often referred to different tree rows by the name of the child responsible for hoeing that row.

Chesley Dinkins (1910-1992) spent his entire 43-year U.S. Fish and Wildlife Service career managing Lake Ilo National Wildlife Refuge in North Dakota.

Maintaining the refuge was a family affair. Refuge headquarters was in their basement. When Chesley Dinkins suffered a heart attack in 1961, his children temporarily assumed responsibility for the refuge. Polly Dinkins did much of the administrative work, but she also poured concrete, operated a tractor and helped with the wildlife surveys. Neighbors referred to the refuge as Chesley's ranch, because he raised cattle along with the wildlife he protected.

Dinkins used to hunt with legendary Refuge System Chief J. Clark Salyer and, although he knew all six people in the regional office at the time, he traveled there as rarely as possible. "I made 17 trips to Minneapolis and hated every one. Couldn't stand the traffic," he said.

Only when he retired did Dinkins move – all the way to Dunn Center, ND, three miles away.

Follow the National Wildlife Refuge System on Facebook at *www.facebook.com/usfwsrefuges* and Twitter@USFWSRefuges.

Send Us Your Comments

Letters to the Editor or suggestions about *Refuge Update* can be e-mailed to RefugeUpdate@fws or mailed to *Refuge Update*, U.S. Fish and Wildlife Service, Mail stop: NWRS, 5275 Leesburg Pike, Falls Church, VA 22041-3803